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PERRENIAL LEGUMES AS FOOD FOR WINTERING BOBWHITE QUAIL

by Eugene E. Woehler

Upland game birds in southern Wisconsin depend on grains and weed seeds for survival during the winter. Northern bobwhite quail are particularly limited by food and cover needs. They eat legume seeds throughout the fall and winter, especially in regions where snowcover is not persistent. Patches of corn and sorghum are planted annually to provide a reliable winter food resource for these game birds. But while annual planting produces results, it is costly and inefficient. A better alternative is to establish perennial plants that have the attributes of corn and sorghum without the need for annual planting.

I studied three native perennial legumes - wild senna, Illinois tick trefoil, and goatsrue - as potential food for wintering quail. These 3 native forbs are moderate to good seed producers. Field trials however, were not encouraging. Trefoil and goatsrue shed seeds in October and do not appear to be viable candidates for winter food and cover. Wild senna shows promise because seed pods retain seed through early December and stems resist breakage in winter. Wild senna seeds must be collected from relic stands and stored dry through the winter until the following spring.

I also studied one variety of perennial bicolored lespedeza (Natob lespedeza) developed in New York as a wildlife shrub. Lespedezas are a common quail food, but they have not been tested in Wisconsin. Natob lespedeza is adaptable only to southern Wisconsin. It requires a long growing season to mature seed and does not consistently produce a large seed crop. Seed matures by late September and seed ripening continues until the first killing frost. It does not retain seed throughout the winter, but a mature stand will provide overhead protection and will reduce snow accumulation. Currently, Natob lespedeza is only available as seed or seedlings from agency or commercial sources.

Establishing Perennial Food Plants

The planting location should be a south facing, well-drained mesic site. Full sunlight is essential. Planting areas should be located at least 50 ft from a woodlot or shrub border to avoid competition for light and nutrients. Abandoned croplands could present a serious weed problem when the sod is

disturbed. Generally, the longer a field has been abandoned, the lower the probability that competitive annual weed species will appear. Droughty or poorly-drained sites are risky areas to consider for bed location. The planting area should also be located near permanent habitat likely or known to attract quail.

I prefer a conventional seed bed created by plowing, disking, and harrowing for seeding perennials on level terrain. The soil surface should be smooth to maintain proper seeding depth. A rotovated seed bed is also acceptable if excess residual cover is removed or burned before tilling. When reseeding or transplanting after small grains, soybeans or vegetable crops, disking and cultimulching should be adequate.

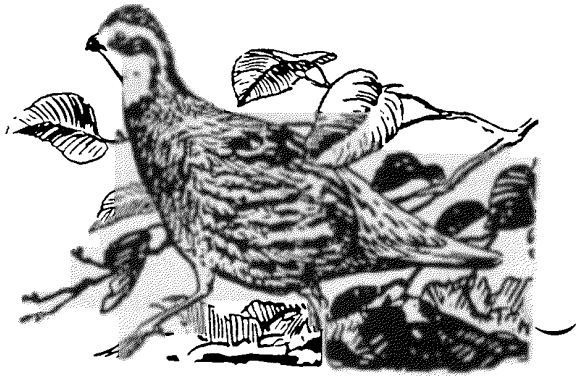
Seeding erodible slopes should be limited to narrow, alternate tilled strips in sod. Seeded strips should be about 8 ft wide to permit at least 4 rows of a perennial food. I recommend a September application of Roundup*® to kill or retard competing grasses and forbs. Residual vegetation can be burned off the following spring to provide a clean seed bed. No-till planting of seedling stock is possible on all sites regardless of erosion potential.

Some legume species develop extremely hard seed coats that inhibit germination. Soil acids gradually erode the seed coat under natural conditions. The percentage of hard seeds that sprout can be determined by a germination test similar to tests conducted for agricultural legume seeds. If hard seeds exceed 40%, scarification is recommended and the seed should then be retested. All legume seeds should be treated with the proper nitrogen-fixed bacterium for the appropriate species at seeding. Planting in soil lacking the innoculant will result in slower, less vigorous growth.

Legume seeds also benefit from cold, wet stratification. Seed can be stratified artificially in plastic bags using sand, perlite or other material to hold moisture and can then be refrigerated at 34-38° F. November seeding in permanent seed beds also accomplishes this goal. Seed will then germinate and develop as soil temperatures and moisture conditions reach favorable levels during the following growing season.

Wild Senna

Wild senna can be seeded in a prairie mixture to increase diversity and improve cover attractiveness, or seeded in monotypic plots or hedgerows. A seeding mixture including 25% senna will ensure the prevalence of senna in a diverse stand. Small monotypic plots or hedgerows can be established on prepared seed beds. Seeding rates are based on number of pure live seed (PLS) at 100% purity and a 100% germination rate. Row width should be restricted to 2 ft with an average seeding rate of 8-10 PLS seeds/ft of row. Wild senna can be broadcast at the rate of 12-18 PLS seeds/ft2, in pure stands or 6-12 PLS seeds/ft2 in a prairie seeding. I prefer a seeding depth of 1/4 inch. Broadcasted senna should be cultimulched, harrowed or



lightly rototilled to incorporate the seed into the soil. Identical procedures should be followed if seeded in the fall.

Natob lespedeza

Normally the optimal planting period for Natob lespedeza is from mid-April to early May. A spacing of 2-3 ft between plants and 5-6 ft between rows is adequate to provide a desirable closed canopy when the shrubs mature after 4-5 growing seasons. Lespedeza hedgerows at least 3-4 rows wide are recommended along field borders, fence lines, or as travel corridors across open fields. Additional plantings along natural hedgerows or as an extension of a woodlot along its southern exposure are also beneficial.

Closed canopies will keep snow from filtering to the ground and may extend the winter feeding period. Southern exposure can offer wind protection and can decrease the snow cover period. We do not know the tolerance of lespedeza to flooding or short-term drought.

Stand Management

With good management, Natob lespedeza will produce seed during the second growing season. Seeds produced vary from soft, immature bodies to fully ripened seeds. Wild senna usually requires 3 growing seasons to set seed. Seed pods dehisce slowly and senna seeds soon drop to the ground after the pods split. Some seed is present until mid-December.

Plantings of lespedeza should not require additional attention if proper establishment methods are used during the first year. Seedling survival depends on the condition of the stock at planting, soil fertility and moisture after planting, proper planting depth, compaction of the soil around the root system, and the level of weed competition. You can expect a survival rate of over 90% if you use recommended establishment methods.

Site differences may affect the rate of growth or the extent of invading weeds. Excessive weed competition will require some level of control, either mowing or selective herbicide treatment.

While the application of a herbicide for weed control in lespedeza or wild senna plantings is risky, a conservative use of Roundup with a wick or wiper applicator can be effective. Mowing will also held suppress reoccurring weed competition. In addition, mulching will give added protection on small plantings by suppressing weed growth and conserving soil moisture.

Some planting sites may be low in fertility and growth could be hampered. If soil tests or poor growth indicate deficiencies, I suggest a corrective application of phosphorus and potassium at recommended rates. Apply fertilizer in late fall or early spring for best results. Without a soil test, a fertilizer low in nitrogen and moderate in phosphorus and potassium (3-10-10 or 6-24-24 applied at 100-200 pounds/acre) should improve growth rates.

The response of wild senna to fertilizer application has not been studied. Where senna is planted in a prairie mixture, periodic burning every fourth year is an excellent management tool to enhance vegetative growth and seed production. Burning, however, should be conducted before wild senna begins regrowth in late April to avoid damage to emerging stems.

We do not know the life expectancy of a productive legume food plot. Wild senna patches will be invaded

by other species as soon as weed control is discontinued, although we expect some natural reproduction of seeded species. Based on observations of relic stands, we know that wild senna will persist for 20-30 years. Natob lespedeza apparently remains useful indefinitely. Mowing has been suggested on older Natob lespedeza stems to stimulate latent crown buds into development of new shoot growth and greater seed production.

In Conclusion

Wintering bobwhite quail depend on grains and weed seeds for survival during the winter. However, most native perennial legumes do not retain seed through the winter, and the nutritional value and palatability of these seeds is in question. From my research I conclude that wild senna and Natob lespedeza show the most promise as potential winter food and cover for quail. Wild senna retains seed through early December and stems resist breakage in winter. Natob lespedeza does not retain seed through the winter, but a mature stand will provide overhead protection and will reduce snow cover for quail.

Developing a perennial plant that provides a dependable, available, palatable, and nutritious food resource throughout the winter for bobwhite quail remains a challenge. Recently, The Land Institute of Salina, Kansas began a long-term project to evaluate perennial plants as an alternative to grain production from annual species. Potential food resources and a reduction of energy input and soil erosion are the primary goals of the study. Genetic engineering may also offer potential for man-made food plants. For the present, we will continue to rely on annual patches of corn and sorghums to carry bobwhite quail through the winter months.

Eugene E. Woehler retired recently after 36 years as a wildlife research biologist for the Wisconsin Department of Natural Resources. He is known for his work on habitat management, prairie restoration, and pheasant propagation.

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*Reference to a manufacturer does not constitute an endorsement of the product.

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